

$$\textcircled{a} \quad \left. \begin{array}{l} x - y = 4 \\ x + 2y = 13 \end{array} \right\}$$

SUSTITUCIÓN

$$\begin{aligned} x - y = 4 &\longrightarrow y = x - 4 \\ x + 2y = 13 &\longrightarrow x + 2(x - 4) = 13 \end{aligned}$$

$$x + 2x - 8 = 13$$

$$3x = 13 + 8$$

$$3x = 21$$

$$x = \frac{21}{3}$$

$$\boxed{x = 7} \longrightarrow \begin{aligned} y &= x - 4 \\ y &= 7 - 4 \\ \boxed{y} &= \boxed{3} \end{aligned}$$

REDUCCIÓN

$$\left. \begin{array}{l} x - y = 4 \\ x + 2y = 13 \end{array} \right\} \xrightarrow{\times 2} \begin{array}{r} 2x - 2y = 8 \\ x + 2y = 13 \\ \hline 3x = 21 \end{array}$$

$$3x = 21$$

$$x = \frac{21}{3}$$

$$\boxed{x = 7}$$

$$\begin{aligned} x - y &= 4 \\ 7 - y &= 4 \\ y &= 7 - 4 \\ \boxed{y} &= \boxed{3} \end{aligned}$$

$$\textcircled{b} \quad \left. \begin{array}{l} 10x + y = 21 \\ 4x - 3y = 5 \end{array} \right\}$$

SUSTITUCIÓN

$$10x + y = 21 \longrightarrow y = 21 - 10x$$

$$4x - 3y = 5$$

$$4x - 3(21 - 10x) = 5$$

$$4x - 63 + 30x = 5$$

$$34x = 5 + 63$$

$$34x = 68$$

$$x = \frac{68}{34}$$

$$\boxed{x = 2}$$

$$\begin{aligned} y &= 21 - 10x \\ y &= 21 - 10 \cdot 2 \\ y &= 21 - 20 \\ \boxed{y} &= \boxed{1} \end{aligned}$$

REDUCCIÓN

$$\left. \begin{array}{l} 10x + y = 21 \\ 4x - 3y = 5 \end{array} \right\} \xrightarrow{\times 3} \begin{array}{r} 30x + 3y = 63 \\ 4x - 3y = 5 \\ \hline 34x = 68 \end{array}$$

$$34x = 68$$

$$x = \frac{68}{34}$$

$$\boxed{x = 2}$$

$$\longrightarrow 10x + y = 21$$

$$10 \cdot 2 + y = 21$$

$$20 + y = 21$$

$$y = 21 - 20$$

$$\boxed{y = 1}$$

$$\textcircled{c} \quad \begin{cases} x-y=4 \\ x+y=2 \end{cases}$$

SUSTITUCIÓN

$$\begin{aligned} x+y=2 &\rightarrow y=2-x \\ x-y=4 &\rightarrow x-(2-x)=4 \\ x-2+x &=4 \\ 2x-2 &=4 \\ 2x &=6 \\ \boxed{x=3} \end{aligned}$$

$$\begin{aligned} y &= 2-x \\ y &= 2-3 \\ \boxed{y=-1} \end{aligned}$$

REDUCCIÓN

$$\begin{aligned} \begin{cases} x-y=4 \\ x+y=2 \end{cases} \\ \hline 2x=6 &\rightarrow \boxed{x=3} \\ x+y=2; &\downarrow 3+y=2 \\ &y=2-3 \\ &\boxed{y=-1} \end{aligned}$$

$$\textcircled{d} \quad \begin{cases} 2x+3y=-5 \\ 3x+2y=-5 \end{cases}$$

SUSTITUCIÓN

$$\begin{aligned} 2x+3y &= -5 \rightarrow 3y = -5-2x \\ y &= \frac{-5-2x}{3} \parallel y = \frac{-5-2 \cdot (-1)}{3} \\ 3x+2y &= -5 \parallel \boxed{y=-1} \\ 3x+2 \left(\frac{-5-2x}{3} \right) &= -5 \\ 3x - \frac{10}{3} - \frac{4x}{3} &= -5 \\ \frac{9x}{3} - \frac{10}{3} - \frac{4x}{3} &= \frac{-15}{3} \\ 9x - 10 - 4x &= -15 \\ 5x &= -15 + 10 \\ x &= \frac{-5}{5}; \boxed{x=-1} \end{aligned}$$

REDUCCIÓN

$$\begin{aligned} \begin{cases} 2x+3y=-5 \\ 3x+2y=-5 \end{cases} \\ \text{Multiplicar la primera ecuación por} \\ -2/3 \text{ para conseguir la "y" igual} \\ 2x+3y=-5 \xrightarrow{\times -\frac{2}{3}} -\frac{4}{3}x-2y=\frac{10}{3} \\ \left. \begin{aligned} -\frac{4}{3}x-2y &= \frac{10}{3} \\ 3x+2y &= -5 \end{aligned} \right\} \\ \hline 3x - \frac{4}{3}x &= \frac{10}{3} - 5 \\ \frac{9x}{3} - \frac{4x}{3} &= \frac{10}{3} - \frac{15}{3} \\ 5x &= -5; \boxed{x=-1} \\ \textcircled{*} \quad 3x+2y &= -5; 3(-1)+2y=-5 \\ -3+2y &= -5; \boxed{y=-1} \end{aligned}$$

$$\left. \begin{array}{l} \textcircled{e} \textcircled{1} \frac{x+3y}{2} = 5 \\ \textcircled{2} 4 - \frac{2x-y}{2} = 1 \end{array} \right\}$$

SUBSTITUTION

$$\textcircled{1} \frac{x+3y}{2} = 5 ; \frac{x+3y}{2} = \frac{10}{2} ; \underline{x+3y = 10 ;}$$

$$\underline{x = 10 - 3y} \textcircled{3}$$

$$\textcircled{2} 4 - \frac{2x-y}{2} = 1 ; 4 - \frac{2(10-3y)-y}{2} = 1 ;$$

$$4 - \frac{20-6y-y}{2} = 1 ; \frac{8}{2} - \left(\frac{20-6y-y}{2} \right) = \frac{2}{2}$$

$$8 - 20 + 6y + y = 2 ; 7y = 2 - 8 + 20 ; 7y = 14 ;$$

$$y = \frac{14}{7} ; \underline{y = 2}$$

$$\textcircled{3} x = 10 - 3y ; x = 10 - 3 \cdot 2 ; \underline{x = 4}$$

REDUCTION

$$\left. \begin{array}{l} \textcircled{1} \frac{x}{2} + \frac{3y}{2} = 5 \\ 4 - \frac{2x}{2} + \frac{y}{2} = 1 \end{array} \right\} \xrightarrow{\cdot (-3)} -12 + \frac{6x}{2} - \frac{3y}{2} = -3$$

$$\left. \begin{array}{l} \frac{x}{2} + \frac{3y}{2} = 5 \\ \frac{6x}{2} - \frac{3y}{2} = 9 \end{array} \right\}$$

$$\frac{7x}{2} = 14 ; 7x = 28 ; x = \frac{28}{7} ; \underline{x = 4}$$

$$\textcircled{1} \frac{x}{2} + \frac{3y}{2} = 5 ; \frac{4}{2} + \frac{3y}{2} = 5 ; 2 + \frac{3y}{2} = 5 ; \frac{4}{2} + \frac{3y}{2} = \frac{10}{2}$$

$$4 + 3y = 10 \rightarrow y = \frac{6}{3} \rightarrow \underline{y = 2}$$